GeoAutomation
Mobile Mapping solutions

Demo Alcatel
28 October 2008

GeoAutomation

is a spin-off company of

KATHOLIEKE UNIVERSITEIT LEUVEN

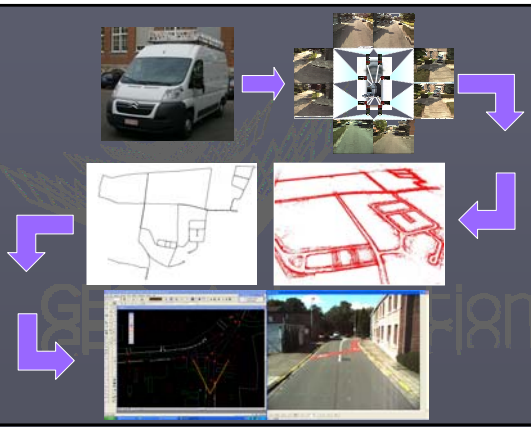
SPC STUDIEBUREAU PATRICK CASIER

GeoAutomation Technology

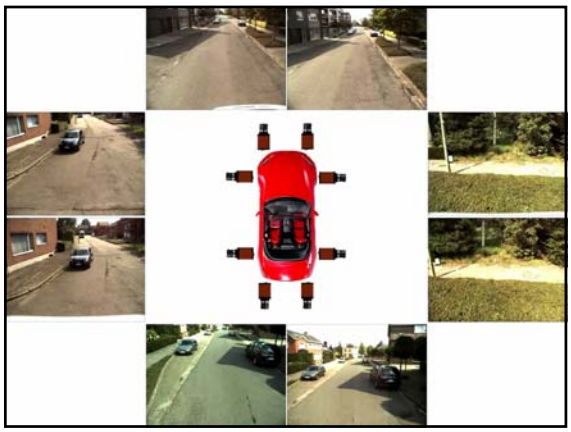
- GeoAutomation developed a hi-tech and efficient solution for surveying applications.
- Mobile-Mapping system: cameras on-board a recording van
- Automatic processing of the images
- Surveying software on geo-referenced images

GeoAutomation Technology Design

- Highest accuracy
- Maximum independence of GPS signal or IMU systems
- Automatic processing
- Highly integrated surveying tool
- Direct use of 3D results for surveying



Recording drive-through

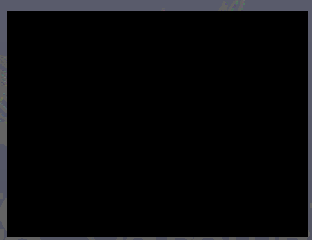




3D Reconstruction

3D Reconstruction

- Structure and Motion (SaM)
- Solution via extraction and matching of image features
  - Matching between images of the same camera at different positions in time
  - Matching between images of different cameras at the same time
- Estimation of motion of the van using all cameras

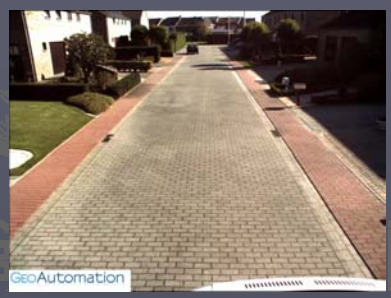


Geo-referencing

- Ground control points, depending on the desired accuracy
  - GPS or total station coördinates for high accuracy
  - Fotogrammetry points for lower accuracy
  - Re-use of already measured points
- Inserted into bundle adjustment with their own weight (depending on the uncertainty)

Geo-referencing

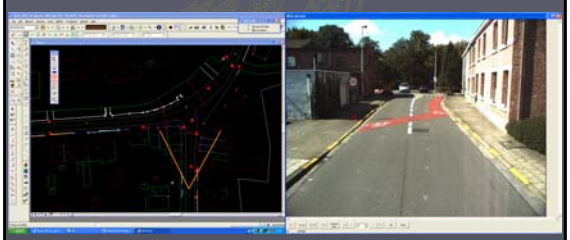
- Advantage w.r.t. other methods: no dependency on GPS signal or IMU stability
- Incorporation of such reference data in bundle adjustment process is no problem
- Surveying without terrain work is an illusion



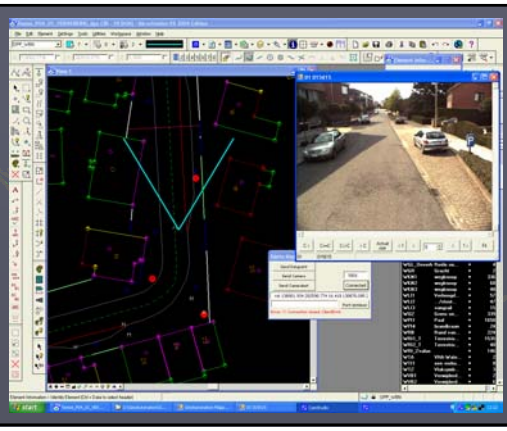
Surveying

- Based on the principle of triangulation
- Clicking points in several images yields 3D coordinates
- User-friendly graphical user interface
- Plugin for MicroStation or AutoCad

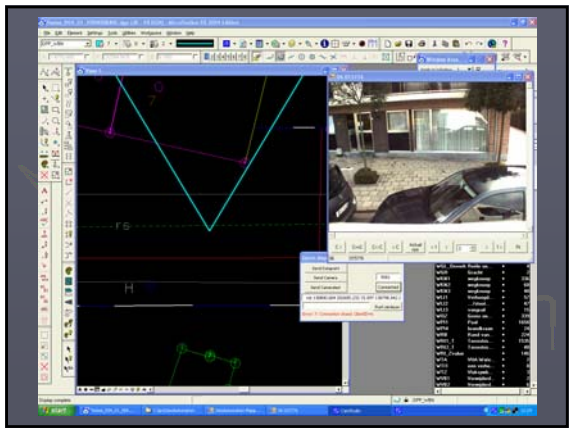
Surveying on the PC



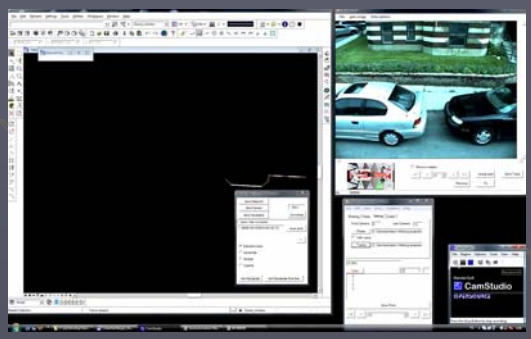
Navigation through the images



Surveying on the images



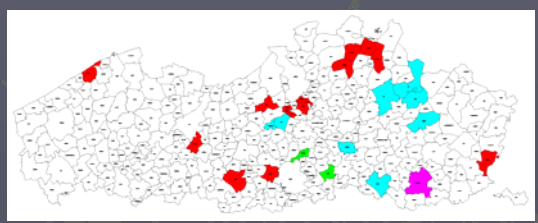
One-click surveying and Interactive 3D modeling



GeoAutomation in practice

- Used for the creation and update of the Flemish large-scale reference database (GRB)
- Required accuracy up to 15cm
- Achieved accuracy in the order of the GCPs
- Several approved deliveries to AGIV

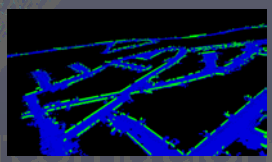
GeoAutomation for GRB



RED = GRB creation, currently active
GREEN = GRB creation, finished
PURPLE = GRB update, finished
BLUE = GRB creation, start-up

Current research

- Automatic object recognition
- Automatic 3D city modeling
  - Façades
  - Ground plane
  - Dense matching for other structures





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